

Flight, March 4, 1911.

# FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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FLYING IN INDIA.—Mr. Henry W. Jullerot giving an exhibition flight over the Calcutta Maidan Racecourse on one of the Bristol biplanes, which are doing such good "missionary" work in the Indian Empire. The racecourse was specially lent to the British and Colonial Aeroplane Co.'s Commission for flying demonstrations, and this is the only occasion upon which flying exhibitions have been given upon it. The Viceregal Party, the Commander-in-Chief, Sir Norman Baker, the Lieut. Governor of Bengal, and a crowd of about half a million people were present to witness the display.

## INVENTION VERSUS ACHIEVEMENT.

A LETTER which we publish in this issue of FLIGHT, from a correspondent calling himself "British Brains," opens up a subject for well-nigh interminable discussion. It is not new—indeed our correspondent himself is not making his initial contribution to the discussion, which was originated by a letter published in FLIGHT of the 21st January last—this question of how far the *inventor* (as distinct from the flying man) is entitled to look for direct help from the wealthy philanthropist. On the face of it, "British Brains," may appear to be perfectly right in his deduction that the giving of large prizes for aerial competition is not in consonance with the best and most economical interests of the science of development. That is a *prima facie* view which may seem to hold water until the theory is carefully examined.

Inventors of the radical type in question are almost always idealists who look for the shortest of short cuts to absolute perfection, but more often than not they have very little basic knowledge of mechanics or of practical engineering. They start with a full appreciation of what is the ultimate goal of attainment but with very little realisation of the pitfalls to be encountered. Once in a while, the inventor happens to be right; and once in a while this radical type of inventor turns out to be the genius that he deems himself. But that is in one case out of a thousand. The rest of the story is one of a miserable display of inexperience and ignorance, and one of bitter disappointment which is writ only too large across the archives of the Patent Office.

In the history of the world's progress very little in the way of radical innovation has been achieved by the direct road, if we may call it that. Progress has been attained by quiet evolution rather than by sudden intuition. Glancing for a moment at the record of aviation itself, it will be found that this general principle holds as good as it does in most other cases. Dynamic flight came to the outside world suddenly; but it was after many long years of experiment and research; and so the advocates of the inventive, or as we prefer to call it the intuitive school are not entitled, as might at first sight be supposed, to say that here is an argument in their favour. The general principles of initial dynamic flight have been very well understood up to the point when only actual flight could tell any more, for a greater number of years than we can safely affirm without the book. In fact, the solution of the main problem of flight has chiefly been of recent times that of a power plant sufficiently light in relationship to its power-developing capabilities. That power plant is now available, but even it did not arrive suddenly and as the result of a revolutionary discovery of a laboratory expert or an inventor with no practical knowledge of the mechanics of the motor. The result has come about through a process of evolution which began long before Gottlieb Daimler made his first cumbersome and heavy petrol engine. Gradually and painfully the motor of to-day underwent alteration and scaling down in weight—as a result of workshop and laboratory and open-air experience and experiment—until gradually a hundredweight or so per horse-power came down to a half, a quarter, an eighth, and each three pounds of weight is now deemed quite a feasible figure.

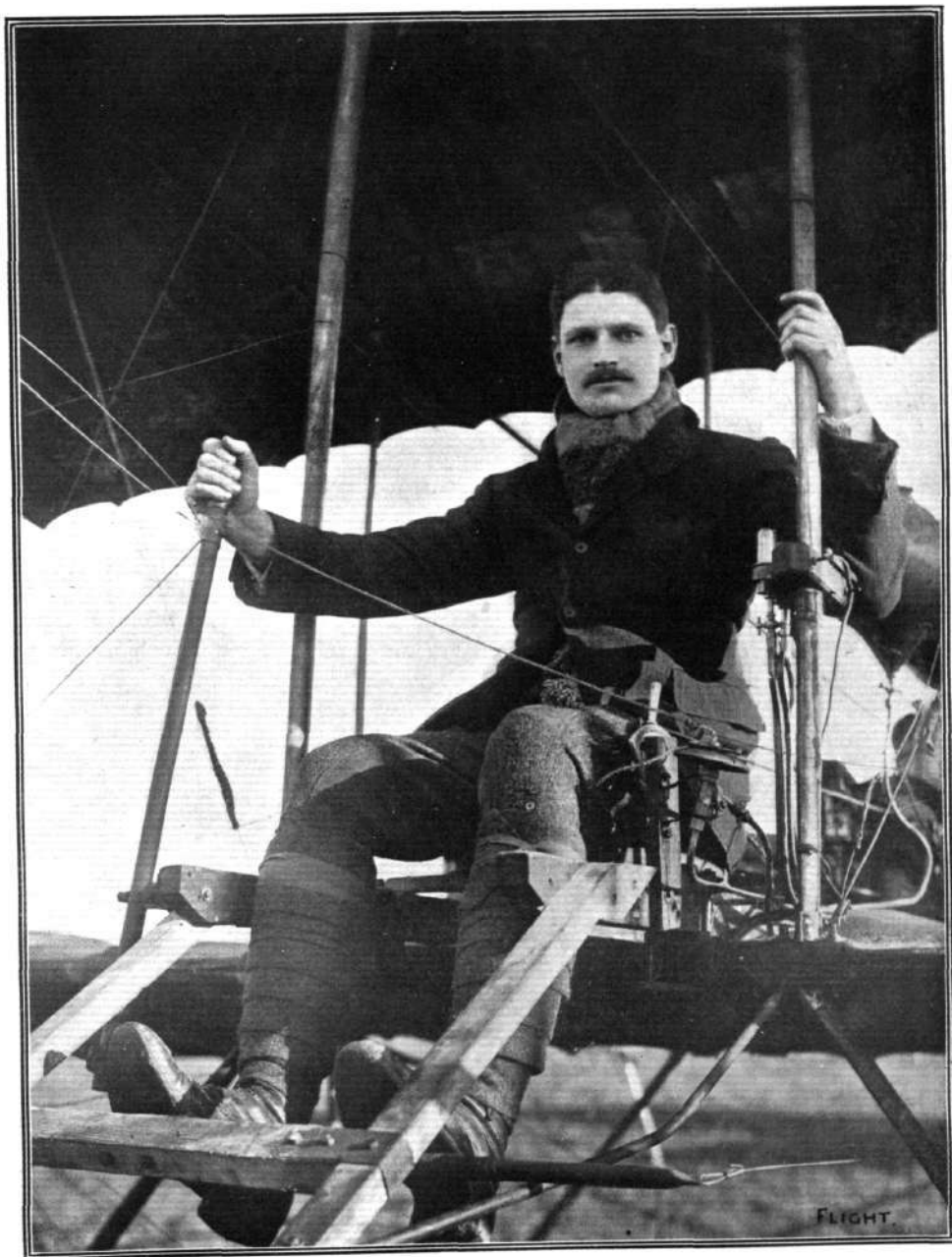
Now, long before the Wrights made their first successful essays in the air it was known by specialists that as soon as the power plants of to-day came to fruition the initial problem of dynamic flight was solved. Applying to that period the arguments of the "subsidies for inventors"

school of to-day, it would then only have needed that a wealthy philanthropist should have come forward with the money for research, and years ago would have been reached the successes of the last couple of years. Also in proof of the fallacy of this line of reasoning may be taken the development of any other mechanical process or movement. The steamship, the locomotive, the printing press, and to come nearer home still the motor car. All have had their crude beginnings, and all of them have developed gradually in accord with the laws of evolution which govern such things. All, moreover, in their initial forms have been condemned by the bulk of those we have termed the radical inventor, and year after year has passed without their pet ideal mechanisms ousting those which have been gradually evolved. Why, then, should we be asked to think that the flying machine is likely to reach perfection by any other road.

To come to the question of prizes for aviators, to which some correspondents seem most strongly to object, there is a query to be propounded which to our mind contains the crux of the whole matter. Will any of the critics seriously aver that if the money which has gone into the pockets of the "contemptible prize-snatchers" (we quote from our correspondent's letter) could have been allocated instead to the direct assistance of laboratory research, aviation would stand where it does as a practical achievement? When a convincing answer in the affirmative is obtained we, for our own part, shall no doubt be able to see eye to eye with them. But until then we must still hold that for the present the existing system of prize-giving is much better calculated to arrive at practical results—not only because it seems to be the only one that will induce the prize-giver to step forward, but also because it constitutes a potent incentive to inventor, designer, and manufacturer as well as to mere "prize-snatcher."

On the other hand, we should like to make it perfectly clear that we have every sympathy for the real inventor who is no mere poser or crank—even though he be of the somewhat ill-equipped and "radical" sort. We fully agree that everything possible should be done to assist him in his work, even if only 1 in 10,000 of his inventions proved to be of real use. One trouble is that far larger sums of money are apt to be required for development than any inventor seems able to imagine, while another is that the average inventor never will believe in the *bona fides* of any other experts who may be deputed to investigate the matter impartially, but who see cause then to express doubts. Apart from that we are not at all sure that even the painstaking and systematic type of inventor—like we believe "British Brains" himself to be—has any very real grievance in the matter, since we ourselves and others are always willing and able to give publicity to all likely notions; and if then he can satisfy those scientific experts of whom "B. B." speaks in his letter, he can rely upon all the financial and commercial aid that he wants—thanks chiefly to the existence of such prizes as those that he seems now to think can do him no good. Adequate initial protection in the chief Patent Offices is not such a very expensive item, after all said and done. Finally, too, the inventor might remember that the value of any particular prize to him is limited to its monetary amount, whereas the industrial concern that wins it can afford to spend many times its face value in the work of commercial development so vital to himself.

## FLIGHT PIONEERS.



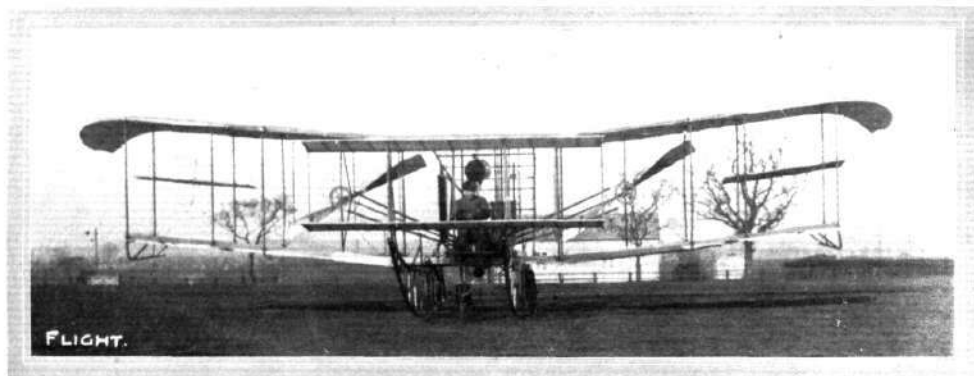
LIEUT. D. G. CONNER, R.F.A.

# THE SANDERS BIPLANE.

FROM A CORRESPONDENT.

THOSE who have followed the progress of aviation and the development of the aeroplane know that the thirty odd different types of British machines now in existence all have some speciality in their design or construction of which their inventors expect great things. There are, however, few machines with so many novel features as the Sanders biplane now flying at Beccles. It was in June, 1909, that Captain Sanders first flew, and from that date until February,

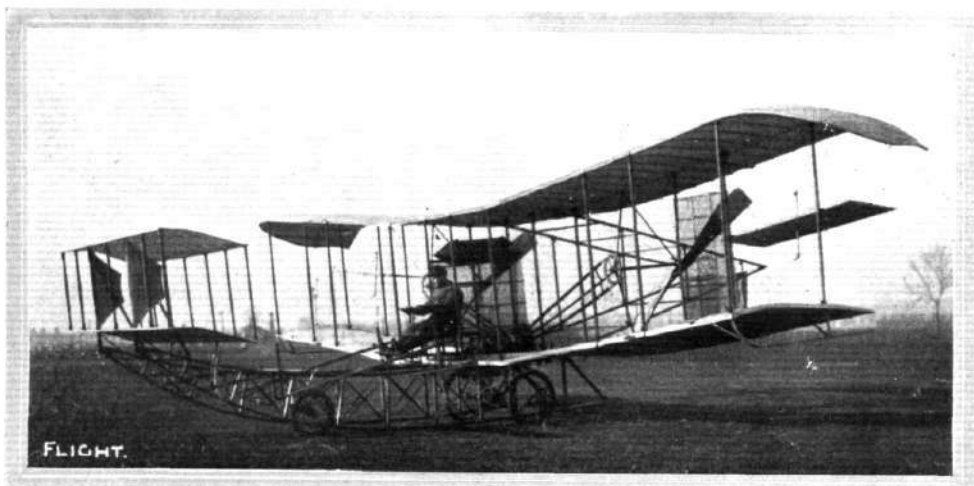
cumbersome, but rather that the safety of the pilot has been made the first consideration of design. As a type it is of considerable interest, inasmuch as it is a biplane with a forward elevator and no tail. It has, however, a triplane rudder carried on an outrigger 12 ft. behind the trailing edges of the main planes and a very peculiar feature of the main planes themselves is that in the centre their own trailing edges are extended by hinged flaps that form a kind of



Front view of the Sanders biplane, Type I.

1910, when his experiments came to a temporary but abrupt conclusion through an unfortunate collision with the telephone wires, he steadily gained mastery over his machine. Nothing daunted by his mishap, reconstruction was at once commenced and the works were at this time also removed to Beccles, where very shortly a flourishing firm was established. Now there is a large shed that houses the biplane and adjacent to it a workshop equipped with every facility

atrophied tail. At the extremities of the planes, midway in the gap between the trailing edges, are supplementary balancing planes. There are also two other supplementary planes in the form of a prow, which is mounted vertically between the planes of the elevator. One of the most important and interesting details of the construction of the Sanders biplane is the under carriage, a massive girder construction, extending from the main planes to the elevator.

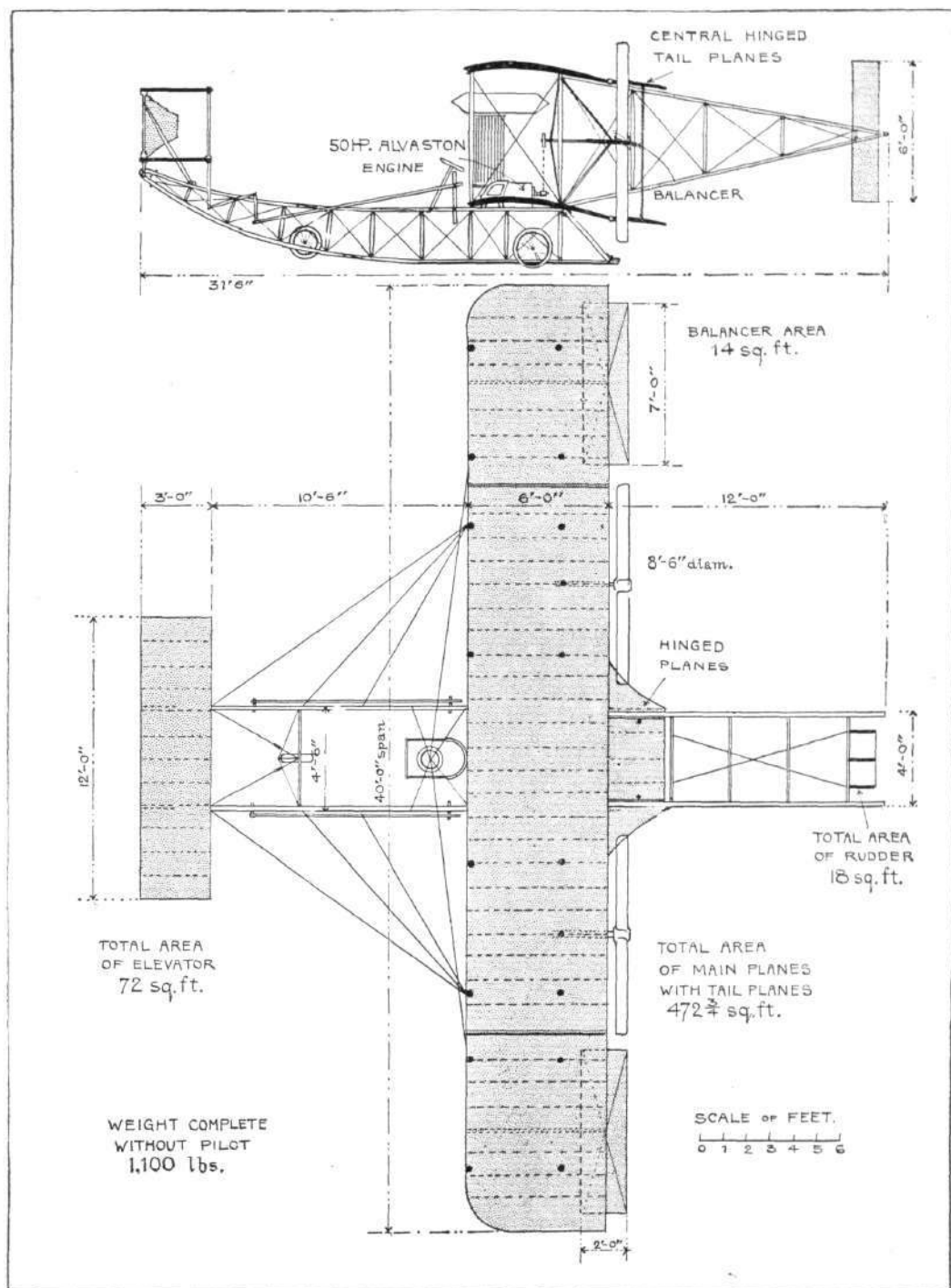


Side view of the Sanders biplane, Type I.

for building duplicates. Every portion of the machine is manufactured in these shops, except, of course, the wheels, engine and certain small fittings that are made outside to the firm's own designs.

In the present Sanders biplane, known as Type 1, because the first of its kind on the market, strength and attention to detail have been aimed at rather than lightness of construction. It should not be inferred, however, that the machine is

It is supported on three wheels, two immediately under the main planes and one well forward. The single wheel is so sprung that it easily adjusts itself to the attitude of the machine when running over the ground and it is the wheels at the rear that carry the greater part of the weight. They revolve on an axle suspended on rubber springs and these springs are so arranged that they can be released by a lever after ascent, and the wheels are thereby drawn up above



THE SANDERS BIPLANE.—Plan and elevation to scale.

"Flight" Copyright.





Captain Sanders at the helm of his biplane.

the level of the skids. Landing is thus accomplished on the skids direct, which not only saves the wheels and axle from damage, but generally is the means of alighting with greater safety.

The control of the machine is effected by a steering-wheel mounted, motor car fashion, on an inclined column, which

has a universal motion on its pivoted support in addition to the rotary motion imparted by the wheel. Moving the steering column sideways controls the balancing planes, while the rudder answers to the circular motion of the wheel. The elevator is controlled by duplicate levers, one on either side of the pilot's seat.

At present the machine is fitted with a 50-h.p. Alvaston motor, which is water-cooled through spiral tube radiators mounted alongside the pilot's seat. The radiators are slightly offset to the direction of flight in order to get an equal draught over all the tubes. Twin propellers of 8 ft. 6 ins. diameter are carried by brackets midway in the gap immediately behind the main planes and are driven by chains at 400 r.p.m. The entering edge of the propeller-blade is peculiar and similar in principle to the entering edges of the main planes, which are concave instead of convex, the idea, according to the designer, being that the air is compressed on contact and afterwards expands against the lower surface.

The main planes have a dihedral angle and the upper plane, which overlaps the lower plane, has down-turned extremities. Both planes are built in three sections and can be easily dismantled. Silverspruce is used throughout for the construction of the spars and framework generally, except for the engine-bed, which is made of ash, and the diagonal bracing of the

under-carriage, for which strip manganese steel is used. Pegamoid cloth is used as a surfacing material.

A new type of biplane is at the present moment being constructed and will be exhibited at Olympia. It will differ, among other respects, from the type illustrated in having a single propeller instead of two.

## DROPPING EXPLOSIVES IN AERIAL WARFARE.

At a meeting of the members of the Royal United Service Institution held on the 22nd ult., and presided over by Sir Andrew Noble, Bart., Mr. Walter F. Reid, President of the Society of Chemical Industry, gave an address on the subject of "The Use of Explosives in Aerial Warfare, with some remarks on Methods of Defence." In the course of his address, Mr. Reid said that the general impression that the use of explosives from aerial craft was prohibited was an erroneous one, both Germany and France having withdrawn from such an agreement in 1907. He did not think there was any doubt that in the next European war explosives from aeroplanes would be used, and if we did not take proper steps to meet this threatened danger from above serious consequences might be anticipated. Unless some great change was made in the construction of aerial craft the attacking power of aeroplanes would be limited by the fact that they would be unable to carry charges of explosives which would do more than local damage. Rapid progress was essential, and to aim correctly from a rapidly-moving platform seemed to be a very difficult matter, and would require great skill and practice to attain average results. Before the end of the year there would, he thought, be a sufficient number of British aeronauts to deal with any foreign airmen who might reach our shores.

Alluding to the relative effectiveness of dirigibles and aeroplanes, he pointed out that an aeroplane could be propelled at such a rate that it could easily overtake the swiftest dirigible, rise above it, and destroy it without being exposed to appreciable danger. The most effective missiles, he thought, were small bombs provided with contact ignition. Aeroplanes, he continued, were free from any serious danger from artillery. He did not say they were out of

range of artillery, but they were out of any serious danger. It was not easy to hit an aeroplane 3,000 ft. or 4,000 ft. in the air. The position as it now stood seemed to be that aeroplanes of the highest speed and efficiency possessed means of attack and defence. Nothing could prevent aeroplanes or dirigibles at night entering British territory unless we had a fleet of aeroplanes to meet them, and, generally speaking, the aerial craft would have to descend to within rifle range to be of any practical use.

In the course of the subsequent discussion Col. F. Stone, R.A., said that the effect of explosives from aeroplanes and balloons had been extremely disappointing to the most sanguine supporters of this method of warfare. The movement was yet in its infancy, but he did not suppose it would revolutionise warfare in any case. The difficulties of hitting from a moving platform and at an uncertain distance from the target must be infinitely greater. He had very little faith in anything like successful practice from the air upon enemies upon the earth. As to the discharge of heavy bombs, speaking roughly, one might take it as a useful guide that a dirigible of 500,000 cubic feet capacity could very easily, in addition to ordinary load, carry high explosives to the amount of at least 1,500 lb. He deprecated the hysterical views as to dirigibles laying towns in waste and playing havoc with the civilised organisation. He thought that once and for all these views should be expelled from the public mind.

Mr. Reid, replying to the discussion, said he thought an aeroplane could carry a charge of explosives of from 200 lb. to 300 lb. at least, provided it was suspended as near as possible to the centre of gravity. As to dirigibles, if a charge of 1,000 lb. were dropped from a dirigible, he should be sorry to be in it.

### The Cause of Hoxsey's Death.

In an article dealing with the fatal accident to A. Hoxsey at Los Angeles the *Scientific American* states that it is believed the aviator was overtaken by a form of mountain sickness which caused him to become unconscious and the weight of his body leaning upon the levers may have moved them sufficiently to make the machine dive at a very steep angle until it finally struck the ground. The remarkable photograph which we reproduce in this issue shows the machine during the last 560 feet of its descent. Just previous to this Hoxsey had come down from a height of 7,000 feet in less than three minutes, and from the experience of Morane and Drexel it is felt that this must have brought on the

sickness. Morane once confessed that as a result of making too rapid a descent he lost control of his machine and was only saved by a miracle. As further evidence of the probability of this cause of the accident, our contemporary quotes the report in regard to blood pressure of aviators made by Prof. R. Moulinier and reproduced in *FLIGHT* some time ago, and further refers to the death of Maloney in California in 1905. This pioneer aviator fell several thousand feet in the Montgomery glider, and an examination of his body showed no broken bones or bruises sufficient to cause death. The doctors gave it as their opinion that Maloney was stricken with heart failure and died during his descent, which, however, was no means as swift as that of Hoxsey.

## THE ARMY AND AERONAUTICS— THE NEW AIR BATTALION.

### The Army Estimates.

In a White Paper issued by the Secretary for War giving the Army Estimates for 1911-12, some official details are given regarding the present aeronautic equipment of the British Army and the additions which it is proposed to make during the present year. This section of the report is as follows:—

"A good deal has been accomplished during the past 12 months towards placing the Army in a position to participate actively in the present development of aeronautics. The balloon factory at Aldershot has been reorganised and enlarged under the directions of an expert thoroughly in touch with all the developments of modern science in this field, and by the end of the present financial year will be in a position to deal with the large airships of the present day."

"In these estimates £85,000 has been provided for new dirigibles and aeroplanes and for the staff and other expenses of the factory; while £28,000 is taken for the construction of a large new shed at Farnborough and the improvement of that at Wormwood Scrubbs. The Balloon School is being reorganised, and will be transformed into an Air Battalion, the officers of which will not be drawn exclusively from the Royal Engineers, but will be appointed for 4 years from any arm of the service, provided they possess the necessary aptitude."

"There are now five aeroplanes available for Army work, of the Wright, Farman, Paulhan, Blériot, and Havilland types respectively. As the result of the trials to be made with these, the patterns for further supplies will be selected. In addition to the two small airships made in the Army factory and one large airship of foreign construction (Clément-Bayard), it is hoped that a second large airship (Lebaudy) and one of medium size, now well advanced in manufacture in the Army factory, will be ready for use in the coming summer."

### The Air Battalion Formed.

ON Tuesday a special Army Order was issued by the War Office giving particulars of the new Air Battalion and its establishment under peace conditions, the formation of which was foreshadowed by the Secretary of State for War in his Army Estimates, given above. The following is the text of this Order:—

"With a view to meeting Army requirements consequent on recent developments in aerial science, it has been decided to organise an Air Battalion, to which will be entrusted the duty of creating a body of expert airmen, organised in such a way as to facilitate the formation of units ready to take the field with troops, and capable of expansion by any reserve formations which may be formed in the future. In addition, the training and instruction of men in handling kites, balloons, aeroplanes, and other forms of air-craft will also devolve upon this battalion."

The establishment of this battalion will be organised into (i) headquarters and (ii) two companies.

The personnel of the headquarters will, in addition to the usual administrative duties, be available to form the nucleus from which the two companies can obtain additional officers, warrant officers, non-commissioned officers and men as required. Each company will be organised as a separate and self-contained unit.

### Qualification of Applicants.

The officers will be selected from applicants from any regular arm or branch of the Service on the active list. An applicant must be recommended by his commanding officer, and be certified as medically fit for the work.

It is not considered necessary to lay down definite rules, except as regards the minimum length of service, but the following qualifications will be taken into consideration when selecting officers:— (a) Special recommendation by commanding officer; (b) possession of aviator's certificate; (c) previous experience of aeronautics; (d) rank not above that of captain; (e) medical fitness for air work; (f) good eyesight; (g) good map reader and field sketcher; (h) unmarried; (i) not less than two years' service; (j) under thirty years of age; (k) good sailor; (l) knowledge of foreign languages; (m) taste for mechanics; (n) light weight (under 11 st. 7 lbs.).

An application for appointment to the Air Battalion will be submitted to the War Office through the usual military channels.

### Conditions of Service.

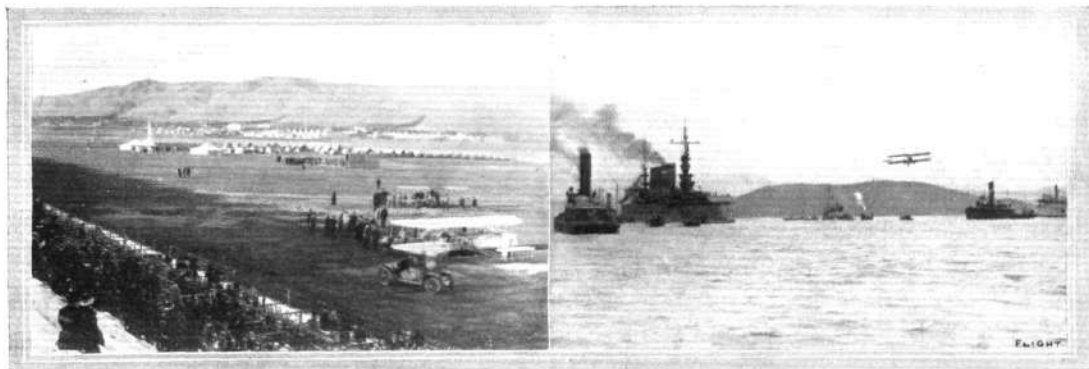
A selected candidate will, on joining the Air Battalion, go through a six months' probationary course (including two months' kite and ballooning), and if during this period he shows no aptitude for the work he will rejoin his unit. An officer who satisfactorily completes the probationary period will be appointed to the Air Battalion for a period of four years (inclusive of the period of probation), and will be seconded. Although the appointment to the Air Battalion will normally be for the above-mentioned period of four years, an officer may at any time be permitted to resign his appointment with the battalion.

An officer, other than an officer of the Royal Engineers, who is selected for the Air Battalion will draw pay under Article 187 of the Pay Warrant from the date of his first appointment to the battalion.

The warrant officers, non-commissioned officers, and men will be selected from the Corps of Royal Engineers.

The existing Balloon School will be superseded by the Air Battalion, and the new organisation will be regarded as taking effect from April 1st, 1911.

An appendix to the Order gives the Peace Establishment of the Battalion. There will be 14 officers, including the Major commanding, and an experimental officer, the acting Adjutant, and six acting engineers on the Headquarters Staff, while each company will have a Captain and a Subaltern. The total number of rank and file will be 153, in addition to which there will be 23 warrant and non-commissioned officers as well as a couple of buglers. The establishment will also include 4 riding horses and 32 draught horses.



The Selfridge Military Camp, San Francisco, from and back to which Eugene Ely flew on his Curtiss biplane when making his flight on to the U.S. warship "Pennsylvania." Note the Curtiss machine in readiness for its trip. On the right Eugene Ely is seen in flight across the sea at San Francisco, en route for the deck of the "Pennsylvania."

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

**Annual General Meeting.**  
The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Thursday March 30th, 1911, at 5 o'clock, at 166, Piccadilly, London, W.

Notices of Motion for the Annual General Meeting must be received by the Secretary not less than twenty-one days before the meeting, and must be signed by at least five members. Wednesday, March 8th (first post), is the last day for the receipt of Notices of Motion.

## Committee.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the Committee are:—

Griffith Brewer	Prof. A. K. Huntington
Major C. de W. Crookshank, R.E.	F. K. McClean
John Dunville	C. F. Pollock
Capt. A. H. W. Grubb, D.S.O., R.E.	Stanley Spooner
Col. H. C. L. Holden, R.A., F.R.S.	

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary in writing not less than fourteen days before the annual general meeting. Wednesday, March 15th (first post), is the last day for the receipt of nominations.

The following members have so far been nominated:—

Griffith Brewer	F. K. McClean
G. B. Cockburn	A. Ogilvie
John Dunville	Mervyn O'Gorman
Col. H. C. L. Holden, R.A., F.R.S.	C. F. Pollock
Prof. A. K. Huntington	Stanley Spooner
	Sir George White, Bart.

Members are reminded that a ballot paper for the election of nine candidates to seats on the Committee of the Club will be forwarded to them at least seven days before the date of the annual general meeting.

## Committee Meeting.

A meeting of the Committee was held on Tuesday, the 28th February, 1911, when there were present:—Mr. R. W. Wallace, K.C., in the chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Col. J. E. Capper, C.B., R.E., Prof. A. K. Huntington, Mr. C. F. Pollock, Mr. Stanley Spooner, and Harold E. Perrin, Secretary.

**New Members.**—The following new members were elected:—*Life Membership.*—D. L. Doolette.

*Ordinary Members.*—William Rowland Ding, Frank Duncanson, George Henry Gordon, Arthur Douglas Ramsay, W. H. Sayers, Donald Francis Charles Stuart-Seton, Douglas Hyde Thomson.

**Aviators' Certificates.**—The following aviator's certificate was granted:—

65. Quinto Poggioli (subject to the Aero Club of Italy).

**The Late Vice-Admiral Sir Charles Campbell, K.C.M.G., C.B., D.S.O.**—The death of Vice-Admiral Sir Charles Campbell, K.C.M.G., C.B., D.S.O., a member of the Council of the Club, was reported, and it was unanimously resolved that a letter of condolence be addressed to Lady Campbell on behalf of the Club.

## Competitions Committee.

A meeting of the Competitions Committee was held on Monday, the 27th February, 1911, when there were present:—Mr. Mervyn O'Gorman, in the chair, Mr. Ernest C. Bucknall, Colonel H. C. L. Holden, R.A., F.R.S., Prof. A. K. Huntington, Major F. Lindsay Lloyd, Mr. J. T. C. Moore-Brabazon, Mr. R. W. Wallace, K.C., and Harold E. Perrin, Secretary.

## PROGRESS OF FLIGHT

A Model Aero Club for Sunderland.

It has been proposed that a Model Aero Club should be formed in Sunderland if a sufficient number of members can be obtained. Anyone who would be willing to support the idea is asked to communicate at once with the Secretary of the Y.M.C.A. in Sunderland, or Mr. Jas. B. Metcalf, at 65, Roker Avenue, Sunderland. In the event of the idea meeting with approval a meeting will be arranged

"Daily Mail" Second £10,000 Prize; The E. Manville £500 Prize; and Michelin Cup No. 2.—The regulations were again under consideration.

"Daily Mail" Second £10,000 Prize.

This contest will commence on Saturday July 22nd, 1911, and the regulations will be published at an early date.

## Gordon-Bennett Aviation Cup.

The following countries have entered for the Gordon-Bennett Aviation Cup:—

America.	France.	Great Britain.
Austria.	Germany.	

Each country will be represented by three competitors. The contest will be held on Wednesday, June 28th, 1911, and the Committee of the Royal Aero Club will make their final decision as to the course within the next few days.

In order to give as much time as possible, the Royal Aero Club has extended the date of entry for the British competitors to May 1st, 1911. Intending competitors are requested to notify the Secretary of the Royal Aero Club on or before that date, of their willingness to compete, if chosen. Entries must be accompanied by a remittance of £20, which amount will be returned should the entrant not be selected.

Mr. R. C. Fenwick, of Liverpool, has sent in his entry.

## Naval Officers at Eastchurch.

The Admiralty has selected the following officers to go through a six months course of instruction at Eastchurch:—

Lieutenant Reginald Gregory, R.N.
Chas. R. Sanson, R.N.
A. M. Longmore, R.N.
G. V. Wildman Lushington, R.M.A.

The course started on Wednesday, 1st inst. Mr. G. B. Cockburn will give instruction as regards the flying, and the construction work is in the hands of Messrs. Short Bros., whose works adjoin the flying ground.

## Lecture by Mr. M. O'Gorman.

Mr. Mervyn O'Gorman will deliver a lecture before the Institution of Automobile Engineers, on Wednesday, March 8th, 1911, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W. The subject will be "The Stability of Aeroplanes and Dirigibles," and it will be illustrated by a number of Pathé cinematograph pictures.

The Institution of Automobile Engineers has kindly placed tickets at the disposal of members of the Royal Aero Club, and members wishing to attend are requested to make application to the Secretary of the Royal Aero Club, 166, Piccadilly, London, W. The lecture will commence at 8 o'clock.

## International Aero Exhibition at Olympia.

The date of the International Aero Exhibition, held by the Society of Motor Manufacturers and Traders under the auspices of the Royal Aero Club, has been altered, and the Exhibition will now open on Friday, March 24th, and terminate on Saturday, April 1st, 1911.

Full particulars can be obtained on application to the Exhibition Manager, Society of Motor Manufacturers and Traders, Maxwell House, Arundel Street, Strand, London, W.C., or the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

In connection with this Exhibition, a section for models will be organised by the Royal Aero Club, assisted by the Aviation Section of the Automobile Association and Motor Union. Full particulars can be obtained from the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

HAROLD E. PERRIN.

166, Piccadilly.

Secretary.

## ABOUT THE COUNTRY.

to discuss general details. A workroom and field for experiments can be obtained.

**Birmingham Aero Club (165, HAMPTON STREET).**

A COMPETITION for models rising from the ground is being organised for members only, and a member has offered a guinea for the best flight. Particulars on application to the secretary at above address.



### Clapham Model Aero Club.

MR. F. C. SANDER, a member of the club, had an interesting experience the other day in a wind that was blowing at about 35 m.p.h. He started a 3½-foot twin monoplane, of his own design and construction, from a small field near the club's workshop. The model quickly rose to a height of 60 feet or more, and coming round with the wind turned head on and flew at a good height across two streets of houses, and for some time was lost. A search was organised, and it was eventually found on the roof of a house some 250 yards away, and rescued by means of a ladder. This, Mr. Sander is inclined to think, is a record for cross town model flying.

### Conisborough and District Model Ae. Soc. (18, CHURCH ST.).

SATURDAY was the last day for the February competition, and though a gale was blowing five competitors ventured on the field, viz., Miss E. L. Allport, and Messrs. F. T. Robinson, H. Cowles, T. S. Wallis, and C. C. Allport. Considering the wind, some good flying was done, the winning flight being 250 ft. by C. C. Allport. The flights were observed by Messrs. J. E. Greathead (committee), F. J. Troughton, and T. Stacey.

### East London Aero Club (ALEXANDRA HOTEL, STRATFORD, E.).

THE workshop, fitted up with benches and complete with all the necessary tools for model construction, is now open. Several members are earnestly engaged upon model work in preparation for the exhibition to be shortly held, also for the club's first flying meeting, so that the workshop presents a busy scene.

### Sheffield Model Aero Club (35, PENRHYN ROAD).

THE workshop of the above club, which is situated at the back of 74, West Street, has been fitted up with tools, &c., and was

opened on Monday, February 20th, for the use of the members, so that model construction is now in full swing. Great credit is due to Mr. W. R. Blake and Mr. C. B. Blake in procuring a workshop so near the centre of the city. Mr. A. Lloyd has presented the club library with two books on aeronautics and scale drawings of the leading aeroplanes. A special general meeting will be held at the workshop, on Wednesday, March 8th, at 8 o'clock p.m. All members are requested to attend as the president, Mr. S. Pattinson, has a proposal to make which will be of considerable interest to all members. All those wishing to join the above club should communicate with C. F. W. Cudworth, hon. secretary.

### SCHOOL AERO CLUB.

#### Arundel House School Ae.C. (15, ARLINGTON ROAD, SURBITON).

ON the four Saturdays of February the members have been busy at Oxshott, where prizes had been offered for the best model aeroplane flights over the well-known Sand Pit. The result of the Senior Branch competition was rather disappointing, none of the machines being able to negotiate a vertical current in the centre, which invariably deflected the models to right or left. The Junior Branch competition was more satisfactory, the flights taking place over a part of the Sand Pit, about 300 feet in width. Similar troubles were experienced with air currents, but Ralph Griffiths succeeded in inducing his Ridleyplane No. 33 to make a very fine crossing, for which he was awarded the prize offered by the Secretary. Good circular flights were also made by the Jones monoplane, a new model of great promise. Numerous spectators watched the flying on all four occasions, the competitions exciting a considerable amount of interest in Surbiton and district.

## BRITISH NOTES OF THE WEEK.

### The Folkestone Meeting.

AT a meeting held at the Folkestone Town Hall on Thursday of last week, in connection with the proposed flying meeting, the Town Clerk announced that so far £400 had been received towards the £1,000 required as a guarantee fund.

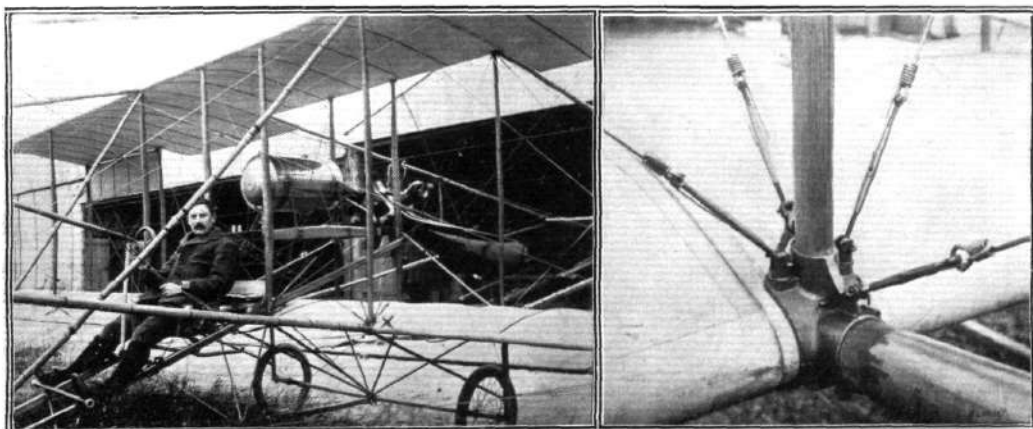
### "The Work of the School Aero Club."

THE lecture under the above title, prepared by Mr. R. P. Grimmer, is proving deservedly popular and those who are anxious to arrange for encouraging the study of aeronautics amongst young people should secure particulars of it, as it contains all the valuable experience of Mr. Grimmer as founder and Secretary of the Arundel House School Aero Club at Surbiton. The idea of forming these aero clubs has "caught on" in France, following the lead by Mr. Grimmer with the Arundel House School, and it would be a pity if that country were allowed to get in front of Great Britain in this

respect. Mr. Grimmer will be pleased to send full particulars to anyone who applies to him at 15, Arlington Road, Surbiton.

### Book Here for Flying Trips.

MESSRS. KEITH PROWSE AND CO., LTD., have now got their booking arrangements in working order and from a little tariff card, which can be obtained from any of their Box Offices, it will be seen that a short flight can be booked for two guineas, while for a flight of three times round the aerodrome at Brooklands or Hendon with a *poi plané* landing the charge is four guineas. A longer and higher flight can be indulged in for an extra guinea, while the charge for a cross-country trip is ten guineas. Messrs. Keith Prowse and Co. intend to make a special feature of aviators visiting gentlemen's estates and then taking passengers for trips on the aeroplane. In the meantime, it should be noted that the firm are the sole general booking agents for Brooklands and Hendon.



**THE PATERSON BIPLANE.**—The view on the left shows how the engine is mounted in the Paterson biplane, while the other view clearly illustrates the extremely neat and handy method of attaching wires and strainers at the point marked X in the left photograph. A new wire can be fitted in ten minutes, all that is necessary being to remove two split pins and replace them after changing the wire.

## FROM THE BRITISH FLYING GROUNDS.



"Flight" Copyright.

Lieut. Snowden Smith about to start on a trip from Brooklands on the Blondeau-Hewlett School biplane.

### Brooklands.

SOME further details of work at Brooklands during the week ending February 18th, which had unfortunately miscarried in the post, are now to hand. On the Tuesday morning, which was quite calm, Mr. Pixton, on the Avroplane, after flying at a good height for some six mins., handed the machine over to Mr. Kemp, who reached a height of at least 300 ft., and continued to fly round at this height for over 16 mins. Mr. Pixton, bent on beating Mr. Kemp's effort, again took a turn in the air, rising steadily until he had reached a height of over 600 ft., remaining up for 20 mins., and descending with a fine spiral *vol plané*.

Mr. Gordon-England came out later on in the day. By this time the wind had got up and was blowing about 20 m.p.h. The Weiss was stable enough in this wind, but Mr. England found that he could not steer owing to the deep body. Mr. Sopwith made a short flight, but decided that the wind was too puffy to be pleasant. After lunch Mr. Sopwith, before making several flights on his Howard Wright, mounted the Martin-Handasyde. On this he made several very good straight flights, the machine flying very steadily, although the wind was tricky. Mr. Beattie, for the purpose of flying for his certificate, brought out the Avroplane and made a start. He flew down the ground as far as the Paddock, and was



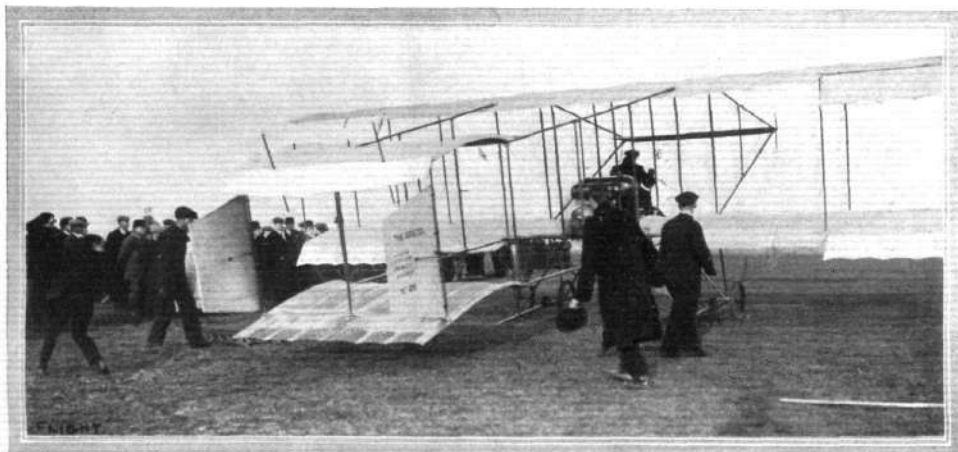
"Flight" Copyright.

**THE FIRST "BOOKING OFFICE" FOR FLIGHTS.**—Messrs. Keith, Prowse and Co.'s box office just erected at Flight Town, Brooklands, for booking passenger flights. This is connected up with London and all the Company's branch offices by telephone.

turning when the machine dived, and although she was wrecked Mr. Beattie escaped unhurt.

Wednesday was a glorious day, with a light north wind blowing. Mr. Sopwith was out several times on the Martin-Handasyde, making several good flights, but at the finish damaged his tractor through landing on his front skid, which gave up and caught the tractor. Mr. Hamel, who was out on Mr. Sopwith's biplane, had a bit of bad luck, owing to a piece of the wreckage of the Avroplane which was left on the ground fouling his propeller, breaking off one blade.

Mr. Watkins had a narrow shave when carrying Mr. Shelly as passenger. When turning up by the sheds, the machine got into



Mr. Low just "off" on his Bristol biplane at Brooklands Aerodrome.

"Flight" Copyright.

an air-pocket, diving sideways with nose down. He just saved the machine, but one of the aileron levers caught in the ground and broke off.

The past week, like all round the country, has been a blank one so far as flying is concerned, owing to the very severe weather.

Capt. Wood and M. Duoroq were to have flown to Hendon and back last Saturday, but had to abandon the project.

#### Laffan's Plain.

OWING to the bad weather there has been no flying this week.

On Tuesday, February 28th, Mr. Cody gave a lecture, "From Kites to Aeroplanes," at the Town Hall, Camberley, the chair being taken by Mr. T. Ridge, Assistant Superintendent Balloon Factory.

#### London Aerodrome, Hendon.

**Blériot School.**—Owing to very bad weather experienced all the week school work has been practically at a standstill. There have been some incidents of moment nevertheless.

On Monday, the 20th ult., another new Blériot monoplane arrived at the school.

Tuesday being the anniversary of George Washington, Messrs. Keeler and Champion, two American pupils, hoisted the Stars and Stripes on the top of the hangars, but, sad to record, this did not bring about any change in the strength of the wind, which kept up mercilessly at a terrific speed.

A French pupil, M. Henri Salmel, has now joined the school, and will begin on the first fine day.

Several passengers have already booked for trips on the new two-seater Blériot monoplane, which is expected at the end of this week, and will be in charge of M. Prier, the chief instructor of the Blériot School, and one of the oldest and best flyers of the Blériot machine.

Arrangements for flights can be made in London with Mr. Norbert Chereau, at the Blériot head office, Belfast Chambers, 156, Regent Street, W.

**Grahame-White School.**—The weather for some time past has been atrocious, and altogether unfit for flying. On Saturday, the 25th ult., however, the wind seemed to moderate a little, as during the early morning it was only blowing at an average rate of about 15 miles per hour.

A very wide interest is being taken in the prize offered by Mr. C. Grahame-White and the Brooklands Automobile Racing Club jointly for the fastest return flight between the Hendon and Brooklands Aerodromes. As early as 2 o'clock last Saturday afternoon, the first day for the attempt, people began to flock into the aerodrome in anticipation of seeing competitors start and arrive. Meanwhile the wind had been steadily rising, and hopes of there being any flying were on the decline. By way of a little excitement the hangars were thrown open and the public were allowed to inspect the school machines. The "New Baby" aroused much favourable comment.

At 4.30 the wind moderated a little, and Mr. Grahame-White took advantage of it by showing the crowd some really good flying on his "New Baby." Keeping close to the ground he covered two circuits of the aerodrome.

The wind at the time must have been blowing steadily at least 30 miles with very strong gusts, just to give variety, every now and



"Flight" Copyright.

Miss Irvine, who last week became Mrs. Martin, on the "New Baby" Grahame-White biplane. Miss Irvine, in the intervals of learning to fly, has made many long flights with her husband at the London Aerodrome.

again thrown in. By the way the machine was buffeted about it was quite evident that the aviator was having none too comfortable a time. Mr. Grahame-White, however, showed fine control over the machine, and finished up with a very graceful descent.

Mr. J. V. Martin then took charge of "New Baby," and although he only made one circuit he, nevertheless, gave a remarkably good demonstration of the art. His iron nerve is only equalled by his confidence in the machine; he has the making of a pilot of the first water. Soon after he brought out the British Farman-Gnome and made one circuit.

Another couple of laps by Mr. Grahame-White brought to a close the day's proceedings, and those responsible for the aerodrome had the satisfaction of feeling that the crowd left the aerodrome in a frame of mind quite the reverse of disappointment.

Monday and Tuesday, the last two days of February, were blanks, due to the rain that fell persistently the whole time.

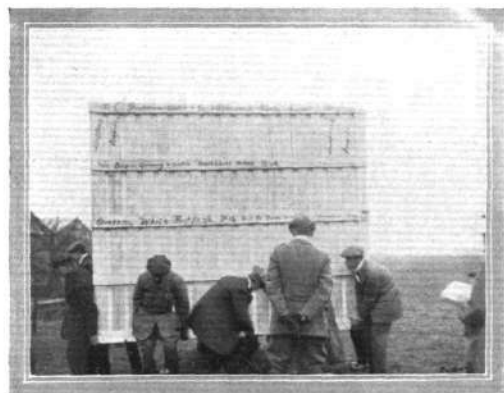
#### Salisbury Plain.

ANOTHER spell of stormy conditions, which has put flying out of the question for some time, leaves very little to record at Salisbury Plain. Mr. G. B. Cockburn is leaving for Eastchurch in a few days to instruct naval officers during a six months' course of flying. The Bristol machines have been put through a good spell of tuning up, and the Bristol monoplane is only waiting for a break in the weather to be brought into work. Mr. Thorne Baker, too, is patiently waiting for a similar opportunity to continue his experiments with wireless telegraphy, the machines and equipment being all in readiness. Lieut. Conner is now much better after the slight accident recently recorded.



#### Aeronautics at Austrian Manœuvres.

A NOTE from Vienna states that in view of the results obtained at the last French Manœuvres arrangements are being made by the Austro-Hungarian military authorities to employ both airships and aeroplanes in the next series of manœuvres.



"Flight" Copyright.

Messrs. Grahame-White, Hubert and Greswell, on Saturday, helping in with the latest arrival at the Grahame-White School at Hendon, from Messrs. Burgess Co. and Curtis, of Marblehead, Mass., U.S.A.

# FOREIGN AVIATION NEWS.

## From Pau to Toulouse.

ON Monday, M. Morin, the well-known Blériot pilot, after only a few days' practice on his latest Blériot machine, succeeded in flying from Pau to Toulouse, a distance of about 100 miles, in 1 hr. 40 mins.

## Statistics of the Blériot School.

SOME interesting figures regarding the Blériot School at Pau have just been published. From November 15th to February 20th there were 67 pupils at the school, including 21 officers, of these 36, including 8 officers, secured pilot aviators' certificates. Forty-two machines were in use, including 14 belonging to the school, and 17 large hangars were occupied. The amount of petrol consumed was 15,500 litres, while 3,800 litres of lubricating oil were disposed of. The "staff," under the management of M. Sallenave, consists of 59 persons, including 17 engineer sappers.

## Fifteen in the Air at Once.

TIME was when it was considered something very unusual to see two aeroplanes in the air at one and the same time, but on the 21st ult. no less than 15 Blériot machines were up simultaneously at the Blériot School at Pau. Amongst these Kuhlring, rising to a height of 1,000 metres, flew off in the direction of Pau, and Lieut. Clavenad, in the course of a 45 min. trip, passed over Tarbes, while Lieut. Malherbe, Princeteau, de Rose, and Conneau went for cross-country excursions.

## A Military School for Pau.

AFTER considerable difficulty arrangements have been made by the municipal and other local authorities at Pau for the establishment of a military aerodrome there. The ground has an area of 110 hectares and is near the Pont Long,

to the south of the Blériot aerodrome and behind the other two flying grounds. It has been leased for a period of nine years and the municipal authorities have offered it to the French Government free of charge.

## M. Clemenceau in the Air.

ON the morning of the 22nd ult., at Montoire sur Loire Sadi Lecointre made a good solo flight on his aeroplane, while in the afternoon he took M. Clemenceau for a 20 minutes' trip.

## Aeroplanes and Battles of Flowers.

USING his Blériot monoplane, which had been decorated for the occasion with flowers, Legagneux, on the 23rd ult., again took part in a Battle of Flowers at Nice. Circling over the Gardens at a height of about 20 metres he scattered a number of small bunches of violets. Two days later he was again in evidence at a similar *fete*.

## Flesch Tumbles in the Sea.

IN the course of a practice flight at Nice, in anticipation of his proposal to fly across to Corsica, the Austrian aviator Flesch met with an exciting incident on the 23rd ult. While flying over the sea the motor stopped and he was forced to plane down. He was picked up unhurt by the steam yacht "Mercedes," which also saved his Etich monoplane, the wings of which were slightly damaged as also was the propeller.

## Prize for Paris-Pau Flight.

THE regulations have just been issued for the 20,000 francs trophy which is being offered by the Aero Club of Bearn for the first aviator who flies between Paris and Pau. Competitors will be required to start from Issy and must state before they start at which of the three aerodromes at Pau they will land. They may stop as many times as they like, but each landing must be recorded and signed by those witnessing it. Should it be necessary to tow the machine, the speed must not exceed that at which a man can walk. The maximum time allowed for the journey is three days.

## New Sommer Machines.

AT Douzy on Monday, Leon Bathiat was testing the new two-seated Sommer monoplane and flew for 40 mins. at a height of 100 metres. Molla was also testing three new biplanes, one with flat planes, the others being of the military type.

## Long Trial with Voisin "Canard."

A BREAK in the weather brought about a good deal of activity at Issy on Monday, when most of the aviators who have machines there were out making trials of one sort or another. Bregi was flying for 2 hours on the Voisin "Canard," on which he also carried two passengers.

## First Pilot Under New Rules.

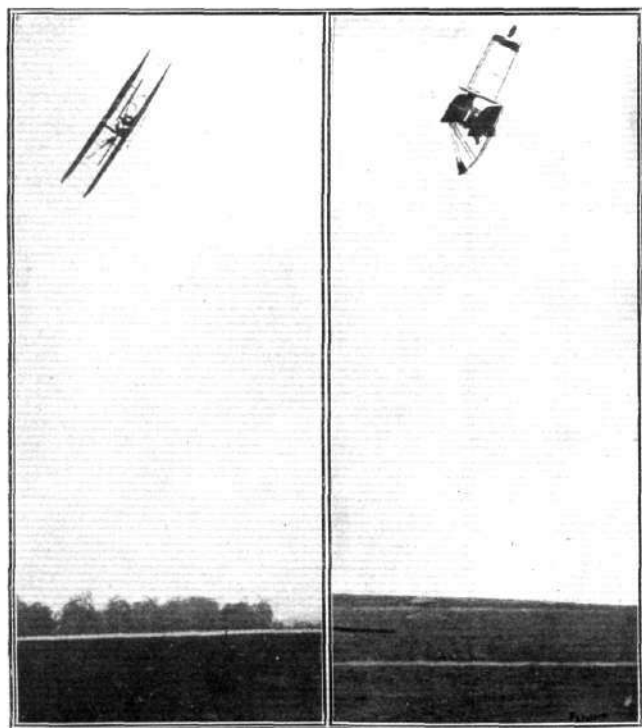
THE first aviator to obtain his pilot's certificate under the new international rules, which came into force last week, was Lieut. de Montjoie, who qualified on the 23rd ult. on a Blériot monoplane at the Blériot School at Pau. Another historical notch.

## Sloane Bi-Curve Very Fast.

DURING its trials at Juvisy, the Sloane bi-curve aeroplane, illustrated in these pages a little while ago, has proved to be very fast. On the 21st ult. it covered a distance of 60 kiloms. (37½ miles) in 43 mins., which it is claimed is the fastest speed attained by biplane.

## Military Operations at Lyon.

IN connection with the military operations which were carried out in the neighbourhood of Lyon last week, Kimmerling, on his



**TWO REMARKABLE SNAPSHOTS OF WRIGHT MACHINES IN FLIGHT.**—That on the left shows Walter Brookins in the course of making a complete circle in 6½ secs., while the photograph on the right was taken of Hoxsey's machine during the fearful plunge, following a "trick" descent, which caused the aviator's death.



Sommer biplane, took Lieut. Jacquet for a trip and the officer was thereby enabled to locate the position of the opposing force, while two subsequent trips were sufficient to enable all the movements to be ascertained and counteracted.

#### Issy Not to be Closed.

It appears that the rumour that Issy was to be confined to military aviators had no foundation in fact, as the military authorities announce that they have no intention of refusing the use of the ground to civilian aviators.

#### An A.C.F. Prize for Motor Tests.

IN connection with the competition for aerial motors which is being organised by the Ligue Nationale Aérienne, a prize of 1,000 francs has been offered by the Technical Committee of the Automobile Club of France. This prize will be given for the motor which, having fulfilled all the conditions of the trial, shows the least consumption per horsepower-hour of fuel and lubricant.

#### A Novel Prize.

A PRIZE has been given under novel conditions by M. Anzani. It consists of a gold "counter," which will be awarded to the pilot of a flying machine, fitted with an Anzani motor, which makes the journey from Issy to Orleans and back in less than 10 hours, a stop being made at Orleans. The winner of the "counter" will receive a daily allowance of 20 francs until his record is beaten. The fees of the time-keeper and all other costs must be met by the aviator.

#### M. Deutsch Orders a Flying Limousine.

EVER to the front in endeavouring to forward the science of aeronautics, M. Deutsch de la Meurthe has ordered from M. Blériot an aeroplane which will be practically a flying limousine. This aero bus will be fitted with four comfortable seats, while the carriage portion will be entirely enclosed, with side windows, &c. It will be remembered that when the dirigible was to the fore in France some years ago, M. Deutsch had the "Ville de Paris" built for himself, and made several journeys in it before presenting it to the Government after the catastrophe to the "Patrie."

#### Police and Clerics in the Air.

M. LEBLANC was busy at the Blériot aerodrome at Pau on the 23rd ult. in giving rides to a number of passengers, among whom were several clergymen, while M. Duponnis, Police Commissioner for Paris, also made one or two trips, possibly with the idea of gaining experience in view of the possibility of his having to organise an aerial division of the police in the near future.

#### Aix-la-Chapelle to Berlin.

ARRANGEMENTS are progressing with regard to the cross-country flying race from Aix-la-Chapelle to Berlin. The competitors will start from Aix-la-Chapelle on April 27th and will fly to Cologne, where they will stay until the following day to take part in the competitions to be organised there. On April 29th they will go on to Dusseldorf, while the remaining stages of the journey will be Essen, Dortmund, Bielefeld, Hanover, Brunswick, Magdeburg, and Berlin. It is probable that at each of these places competitions will be organised on the days following the arrival of the competitors. The three first prizes will be of 100,000 marks, 40,000 marks, and 20,000 marks respectively. The event, it will be remembered, is only open to German aviators, flying German machines.

#### A Hangar Blown Down at Tegel.

A STORM which broke over Tegel on the 22nd ult. blew down a transportable hangar, which had been erected for the housing of a new Parseval dirigible. The structure was 150 metres long and 30 metres

high, and sustained such severe damage that it was decided to have it completely demolished.

#### The Tour of Belgium.

THE organising committee of the aerial tour of Belgium, which is to take place next August, is finding it awkward to satisfy the demands of all the towns which wish to be made stopping places, and there will be some difficulty in deciding on the seven stages. In addition to these points, there are also to be fixed controls and flying controls *en route*. In the former the competitors will have to descend in order to make replenishments, while at the latter they will be required to circle round a church tower or some other prominent landmark.

#### Curtiss Makes Further Progress.

CONTINUING his experiments at San Diego, California, Curtiss last week succeeded in carrying a passenger during a flight in which he started from the land, came to rest on the sea, started up again, and flew back to his starting place.

#### A Flying Meeting for Havana.

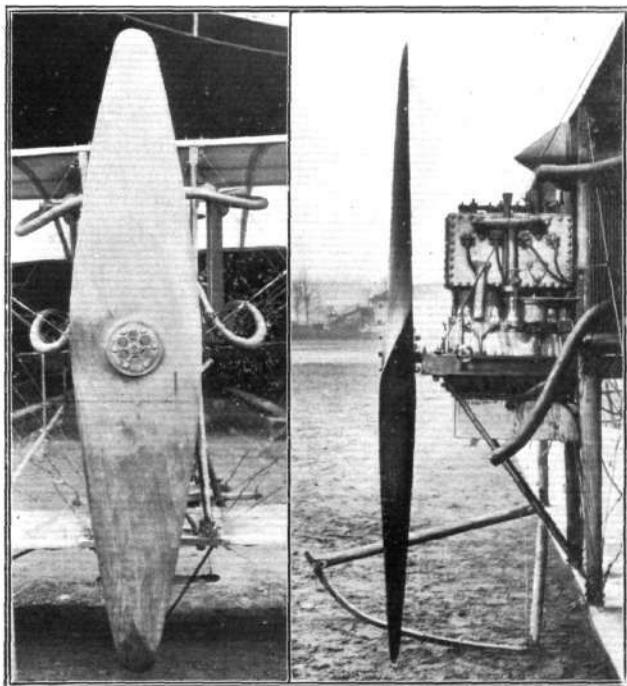
ARRANGEMENTS are being made by the Aero Club of Cuba for a meeting which will open at Havana on the 18th inst. The prize list amounts to over £6,000.

#### Flying Meeting in Mexico.

ON Monday a flying meeting was opened at Mexico by the two French aviators, Garros and Barrier. The wind was very troublesome, but in spite of this the former went up to a height of 600 metres, while the latter flew 30 kiloms. in 20 mins.

#### Russian Army and Aviation.

ACCORDING to a telegram from St. Petersburg, the Committee of National Defence of the Russian Duma has approved of the expenditure of £1,000,000 on the development of military aviation.



**THE CYRNOS PROPELLER.**—The above illustrations show a new propeller in use on the Gaudron biplane. The design is due to M. Fillipi, and appears to be based on the assumption that the two blades may together be considered as analogous to one aeroplane. The generally accepted view, however, is that each blade separately should be considered in this light.

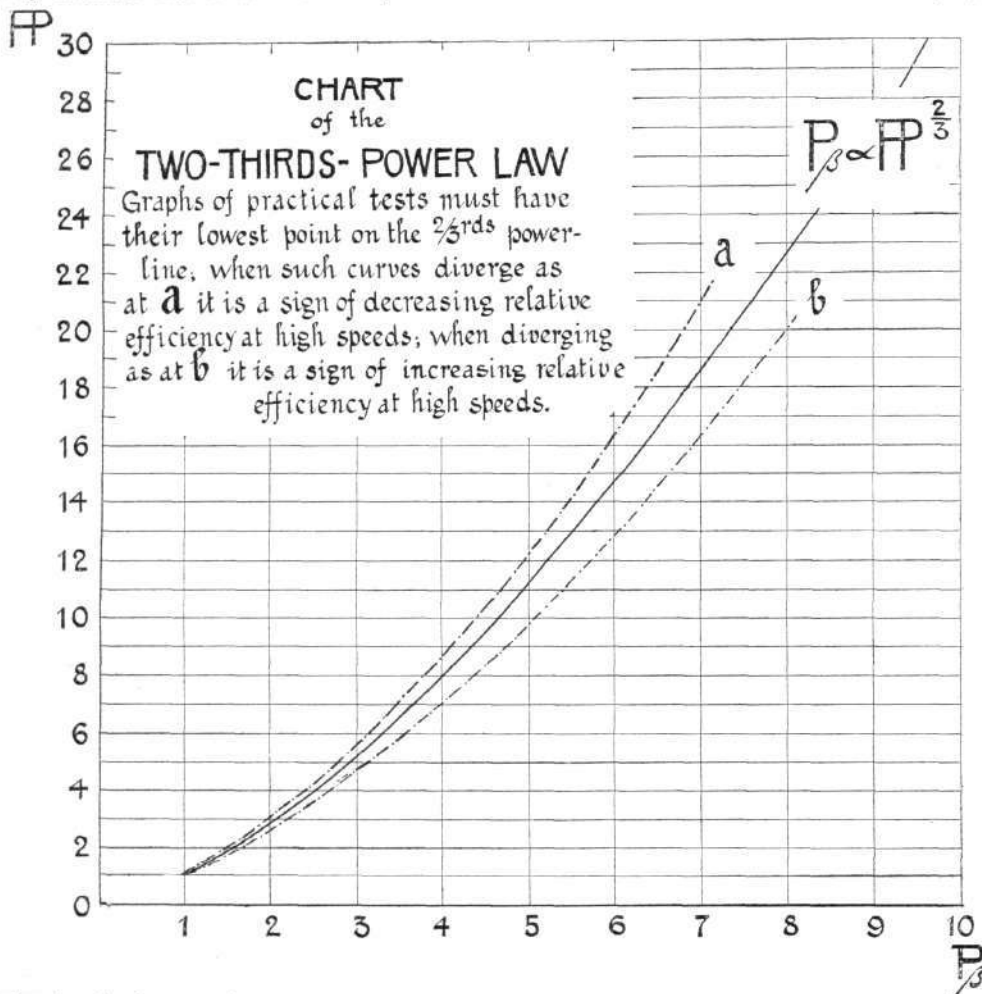


## THE TWO-THIRDS-POWER LAW.

THE accompanying chart illustrates graphically an important law of aerodynamics. One of the principal applications of this law is associated with the testing of cambered planes and propellers to find out the effect of increasing the engine-power without altering the angle of the plane or the blade.

The curve represented by the full black line in the accompanying chart shows the lift, loading, or thrust as the case may be, in terms of the two-thirds power of the horse-power, and this relationship indicates the theoretical relative values that obtain for the plane alone, neglecting, of course, all supplementary resistances such as are introduced by the con-

for the same plane, is a function of the two-thirds power of the horse-power. Being theoretical, it is therefore interesting as an indication of the nature of the results that may be expected and on these grounds it is also very useful as a means of estimating the behaviour of a plane or propeller from data obtained in actual tests. When using the chart for this purpose, however, there is one very important point to be borne in mind, viz., that the figures corresponding to the lowest power test in the experiment must be located actually on the theoretical curve. Thus, for example, suppose the static thrust of a screw is being tested and these tests start with a measurement of the thrust when 1-h.p. is applied



structional work of an actual aeroplane. The two-thirds power law states that if the power is doubled the loading of the plane will be increased 1.6 times, or if the horse-power applied to the shaft of the propeller is doubled the thrust will be increased 1.6 times, and the full line curve in the accompanying chart shows corresponding ratios for any other increment in power.

Now this curve is a purely theoretical graph, based on the fact that as the loading of a plane is proportional to the square of its speed and the power is proportional to the cube of the speed with the same plane (which must not be confused with the law that the coefficient of flight is independent of velocity) the relationship between the loading and power,

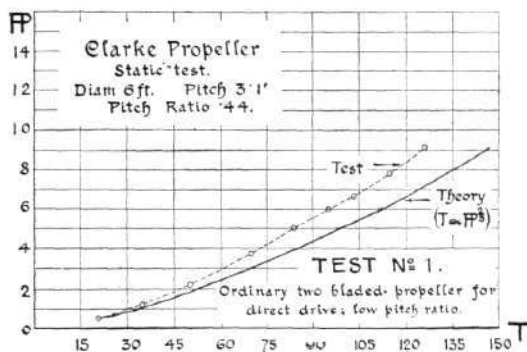
to the shaft, then the point on the two-thirds power curve that is intersected by the 1-h.p. ordinate according to the scale of horse-power, must be used to set the scale of thrust. Suppose the thrust is 14 lbs., then the scale of thrust on the accompanying chart must be altered in the ratio of 14 to 1. The chart itself has for convenience been prepared with a range of from 0-h.p. to 30-h.p., but this scale may also be multiplied by any convenient factor in order to bring the numerical values within the limits of the experiment.

It is essential that the least powerful test in the experiment should coincide with the theoretical curve, because the object of this graphic method of examining the results of the trial is to see whether the increase in power produces the

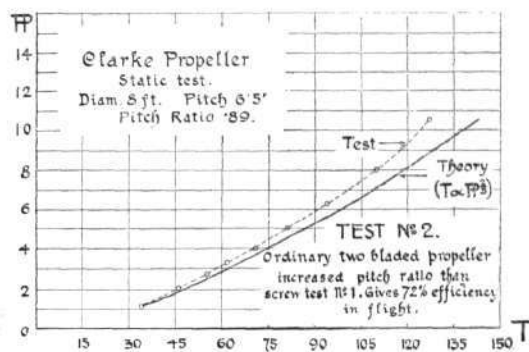
increase in thrust that theory indicates should be available, consequently it is obviously necessary to have one point in common between the theoretical and practical graphs, and it is equally obvious that this common point must coincide with the test of least power inasmuch as the curve itself is based on a comparison of increments in power and thrust.

When, as will probably happen, the graph representing

higher speeds than could possibly have obtained had the angle itself not varied. Apparently, therefore, such a situation as that represented by the curve (b) would seem to offer conclusive evidence of a change for the better on the part of the angle, whether or not such variation was actually designed to take place. So far as curve (a) is concerned there are always many causes that will account for inefficiency

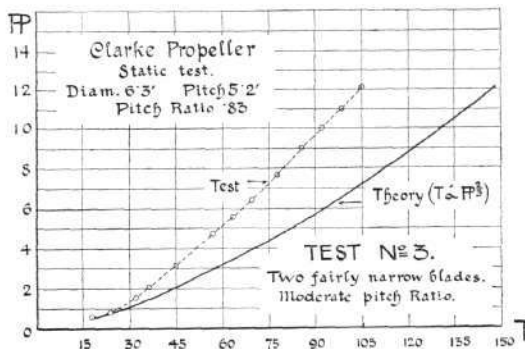


the practical test does not coincide with the theoretical curve, it may diverge so as to lie above or below the two-thirds power line. If it lie above, as at (a) in the accompanying chart, the comparison indicates decreasing efficiency with increasing speed. On the other hand, if the practical curve lies below, as at (b) the indication is that the efficiency

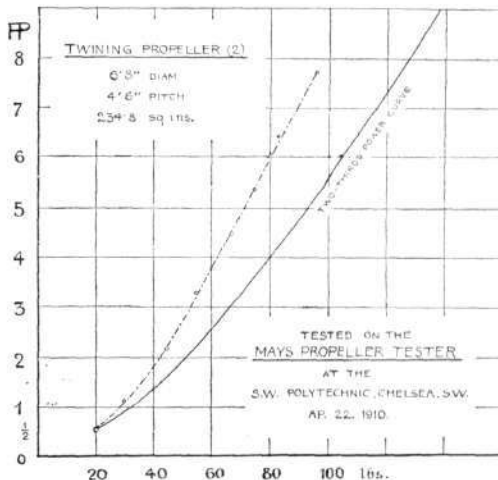


and it rests with the experimenter to decide which of the prevailing factors in his test has had the predominating influence.

By the courtesy of Messrs. T. W. K. Clarke and E. W. Twining we have been provided with a set of data obtained from actual tests of some experimental Clarke propellers and these we have reproduced graphically in the other charts,



is improving with the speed. This latter is quite a possible condition and does not in any way mean that the theoretical basis is wrong. Various articles that we have written have shown that there is an angle of least resistance for cambered planes and it might be that the low speed test took place with a plane having an initially inefficient angle. If the angle itself improved in efficiency with increasing speed, then the ratio of the loading to power would also improve and the net apparent effect would be a better efficiency at



which serve to show how this two-thirds power curve is used as a comparison in some actual cases.

## DEATH OF GENERAL BRUN.

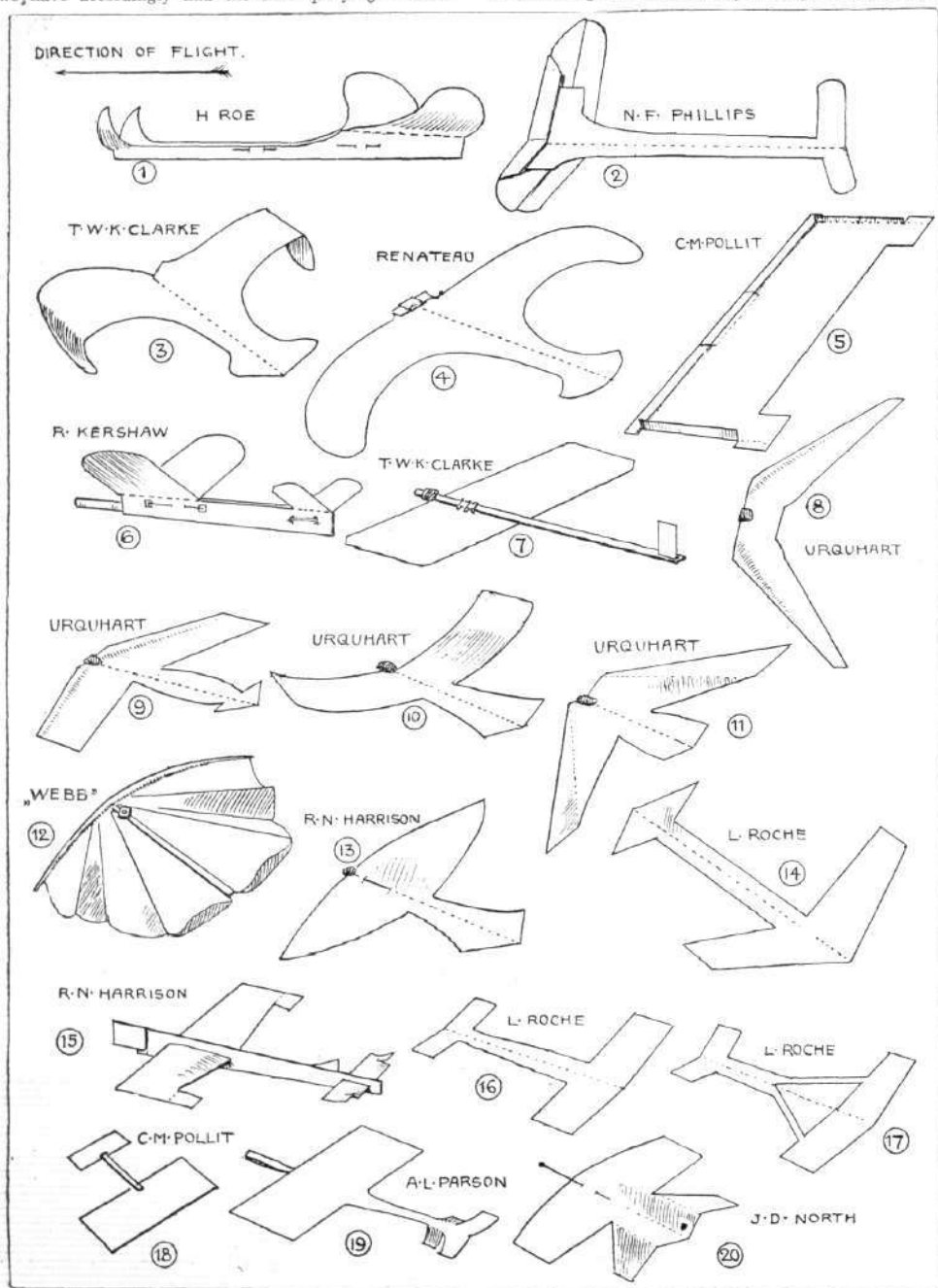
By the death of General Brun, Minister of War, the French Army has lost an officer who has been largely responsible for the splendid official encouragement to aviation in France. For some days General Brun had been suffering from an attack of influenza and had been confined to his residence, but no particular anxiety was felt on that account. On the morning of the 23rd ult. he appeared to be in fairly good health, but later in the day was attacked by a fainting fit and failed to recover from a second seizure. General Brun's name is not likely to be forgotten, at any rate in the annals of aviation, for he was largely responsible for the proper organisation of the Aerial Corps in connection with

the French Army, and the success of both airship and aeroplanes at the great manoeuvres in Picardy last autumn proved how sound his far-seeing policy was. General Brun was born on April 4th, 1849, and entered the Army from the Artillery and Engineering School of Metz on October 1st, 1869. He took part in the defence of that city during the Franco-German War, and on its fall was sent as a prisoner of war to Germany. On his release he recommenced his studies as an artillery officer at Fontainebleau, and after a brilliant career as an artillery officer, became Chief of the General Staff on August 1st, 1905, and Minister of War on July 24th, 1909.

## PAPER MODELS.

It is a pleasure to acknowledge the receipt of such a number of very interesting paper models that have been sent to us in response to a request published in a recent issue. Although we did not originally wish to have these models for publication purposes, nevertheless, their variety and interest is such that we thought that others might like to see some of them, and we have accordingly had the accompanying sketches

prepared of the more important types. For variety and ingenuity they certainly form a remarkable collection, and what is of more importance—they all fly, some excellently, very few indeed indifferently. That which struck us more than anything else when trying these models was that practically all of them made a respectable flight on the first time of launching and without any attempt whatever at adjust-



ment. This, we think, is the more remarkable as paper models are notoriously difficult to keep ship-shape and there was really every excuse for failure. On the whole, therefore, it was rather an instructive lesson on the very real nature of stability once that quality has been inculcated into the design.

It will be observed from a mere glance at the drawings, all of which are arranged one way, that some of the models fly tail first, as for example do those of L. Roche (Nos. 14, 16, 17). Another constructed on this principle is that sent in by H. Roe (No. 1), which is the crudest sort of device, but nevertheless demonstrates the gliding principle. Quite a clever design is that of N. F. Phillips (No. 2), in which the disposition of the load is obtained entirely by folds in the paper. But as the paper in question is of the ordinary exercise sort, the construction is rather too flimsy to be useful. Another paper monoplane having some points of resemblance to the Roe, but flying with the main planes in front, was sent in by R. Kershaw (No. 6), and the clever point in this design is the use of a little spill of paper sliding telescopically in the body for the purpose of adjusting the balance. Comparing tail-first gliders with head-first gliders the essential difference is, of course, the necessity for a concentrated load in the vicinity of the leading edge of the main planes on the latter type. In the tail-first monoplanes no such load is ordinarily necessary as the tail itself appears to serve this purpose.

The ballasted flat plane in a slightly elaborated form was sent in by C. M. Pollit (No. 5), but in spite of the modifications from the absolute simple rectangular plane it is still possible to notice the extreme sensitiveness of the flight of this particular form of model when made in paper. A further modification of the flat plane was submitted by T. W. K. Clarke (No. 7), the plane in this case having a light mahogany backbone carrying lead wire as ballast in front and a fixed rudder plane behind. The behaviour of this model is excellent, but its weakness lies in the nose, which easily breaks. For that reason we had to improve

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## WOOD WAFER WINGS.

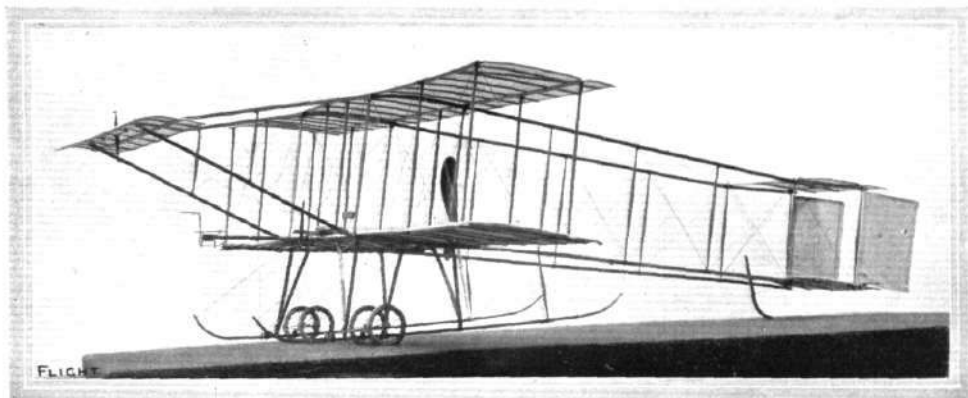
MODEL-MAKERS who are on the look-out for a new surfacing material for planes will be interested in the thin wood supplied by Messrs. Ralph Turner, of Langley, Bucks, for this purpose. The sheets are capable of taking a 2-ft. span and 3-in. chord in one piece and are only  $\frac{1}{16}$  in. thick. Needless to say, they can be bent to any camber and the problem for the model-maker is to fix the camber without adding undue

upon Mr. Clarke's construction by using some of his lead wire in order to stitch the head on to the body. A pin inserted through the ballast serves as a splint and substantially strengthened the construction. Another Clarke model of the birdlike variety is shown in No. 3, and a similar type by Renateau in No. 4.

Quite the most interesting of all the models, however, is that illustrated in No. 8 and submitted by D. Urquhart. It is a tailless cambered monoplane and flies perfectly; indeed, it perhaps flies better than any other of those illustrated. An ordinary rectangular cambered tailless monoplane is, as our readers know, quite unstable, but the back-turned wing tips in the Urquhart model serve the purpose of a tail as they do in the Dunne machine, which is the explanation of its stability. From the same correspondent two other models, 9 and 10, were also sent in, the former having a cambered plane and the latter a flat plane which will only fly with a dihedral formed as a semi-circle.

A very well-known paper glider is the Webb, No. 12, which is an excellent flyer and very instructive. These little gliders are, as a matter of fact, actually on the market, and those who do not know of them would do well to secure a box for the modest outlay of 6d. and make a few experiments. The little lead ballast weight on the backbone can be set in any one of a series of holes, and it is most interesting to observe the different effects produced by shifting the position. A simple little model balanced by a shifting pin is sent in by J. D. North (No. 20), while the balance on A. L. Parsons' model (No. 19) is formed by the extension of the wooden backbone. The R. N. Harrison glider (No. 13) is also very simple, being ballasted by a pin and lead foil. Another model made by Mr. Harrison (No. 15) is particularly interesting because it is made of cardboard and has a cambered plane. But for the high efficiency of cambered planes, we doubt if a model made of such heavy material would glide successfully. The C. M. Pollit glider is a fascinating little miniature tail-first device, the two planes being held in the split extremities of a match.

⊗   ⊗



A "SPECIMEN" MODEL.—Model Farman biplane to scale, 1 in. to 1 ft., built by Mr. G. P. Smith, of Fulham, from the Twining Aeroplane Company's No. 10 parcel of materials and working drawings. The model is driven by a Chauviere pattern propeller geared in a ratio of 3 to 1 with the elastic rubber motor. The whole "power plant" is placed on the centre of gravity of the machine. The landing gear is exactly the same as in the prototype, with rubber ring suspension and radial arms. The rudders are moved by foot cross-bar, the elevator by lever on the right-hand side of the aviator's seat. Mr. Smith has put some very neat and careful work into the model, and the Twining Aeroplane Company inform us that they have had other fine examples sent them of Bleriot, Wright, and Antoinette machines made from their well-known sets of materials. These sets are in all cases accompanied by full drawings and instructions, and some twelve different parcels are in all supplied at prices ranging from

1s. to 3s. 9d.

## CORRESPONDENCE.

\*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in **FLIGHT**, would much facilitate ready reference by quoting the number of each such letter.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

### "All-British" Encouragement.

[1087] It is evident that I failed to make my meaning clear in my letter No. 1028, and that the fault is entirely my own. I am not a flying man, and never shall be one: the question of personally competing in the *Daily Mail*, or any other similar competition, was not present to my mind. I wished to urge that, if any advance is to be made, it is of far more importance that the machine and the inventor should receive encouragement than the pilot.

Unless an inventor be a wealthy man there is an impassable gulf between him and such a prize as that of the *Daily Mail*. If flying men like Mr. Moore-Brabazon have to give up flying competitions on account of the enormous expense involved and the unfairness of the conditions, which are all in favour of the foreign aeroplane syndicates, with their staffs of mechanics and wholesale supply of "spares," how is an inventor who is neither wealthy nor qualified as pilot-aviateur to derive any benefit?

Nothing is done by such a competition to encourage research, whether into mechanical and scientific principles, or into new types of machine. Far from stimulating British originality, it tends to further foreign interests and to stereotype one kind of machine. There is no difference in principle between the aeroplane of Stringfellow, dated 1848, which you have illustrated, and the latest type of monoplane.

After years of research and experiment, and the expenditure of nearly £1,000, an inventor discovers and develops the application of a new principle, independent in every way of flapping wings, helicopters and screw propellers. It promises to be an enormous success, in which case its importance to this country cannot be over-estimated, but the ultimate proof can only be given by the performance of a full-sized machine, to build and test which, with the resources of a small private workshop alone available, will be a tedious and expensive matter. How does the *Daily Mail* prize help such a man? What possible benefit can he be said to have derived from the £10,000 won by M. Paulhan last year?

If it be legitimate for a newspaper to spend £10,000 in advertising itself by giving a prize of that amount to a wealthy aeroplane syndicate for a performance which will depend largely upon organisation and lavish expenditure in providing for every contingency, why should it not be equally legitimate for a soap or pill firm to advertise its wares by helping forward a purely British invention, which is certainly an immense advance upon anything at present in existence? Not a penny of the soap and pill money need be spent until scientific experts have satisfied themselves that the claims made for the invention are sound.

The prospect of this country leading the world in aviation is a poor one indeed if it depends upon our copying, or buying, French aeroplanes, Gnome engines and Chauviere propellers.

BRITISH BRAINS.

[We refer to this subject in our leading article this week. Here, we cannot refrain also from drawing attention to the third paragraph of the above letter. Surely, by "British Brains" own showing, it is the British originality of Stringfellow that is at length being recognised, even though those wicked foreign interests of which he complains are mean enough to try to profit by it.—Ed.]

[1088] Your correspondent, "British Brains," is apparently very upset by the results of recent flying races.

He rails against the promoters of the large prizes offered; he, however, loses sight of the fact that these prizes can be won on any type of flying machine, and that this being so, it is reasonable to suppose that the best type of machine would win. It is not pleasant to think that British inventors are unable to carry off these prizes, but why blame the promoters?

If "British Brains" were to build his machine and win one of these prizes he would be entitled to consider his machine as good as and perhaps better than his competitors'; and he would reap the benefit of his labours. Present-day machines have accomplished successful flight; it remains for others to improve this; and "British Brains" is evidently trying to do so. Let him take his model and convince practical flying men not "scientists" that the principle of working is sound and feasible and he will surely find one to support him.

Manchester.

"FAIRPLAY."

### The Banefulness of the Extremist.

[1089] In a "leader" under the above title in your issue of February 25th, a reference is made to Professor G. H. Bryan, *apropos* of an article from his pen which appeared in the *Cornhill*. I hold no brief for Professor Bryan, but I have read his article rather carefully, and your firm though quiet disapproval moves me to protest.

The article—as I read it—boiled down to its bones, stated that in aviation undue risks should not be taken without a justifiable object, that the problem of stability was all-important, and that there were no prizes or encouragement for the mathematical development of the science. Stress is laid on the fact that practice and theory should go hand-in-hand and be interdependent. "Of course," says Professor Bryan, in his own italics, "it would be as absurd to attempt to fly on mathematical principles only as it is absurd to expect to get to the bottom of the problem of stability—for that is what was required—without mathematics."

Where is banefulness, where the extremist here? The Professor simply expresses his opinion, which surely every man is entitled to do—that the mathematical and scientific side generally of aeronautics was neglected. I venture to think that there may be some people who will more or less agree with him.

Why **FLIGHT** should object, however courteously, when Professor Bryan says that the present machines are unstable (which they are) and that mathematics with a little encouragement could do something to rectify this (which it probably could), I confess I am at a loss to determine. The "leader" in question seems to require an explanatory footnote.

T. O'B. HUBBARD.

[If Professor Bryan had merely contented himself with the platitude that "undue risks should not be taken without a justifiable object," we should not have quarrelled with his *Cornhill* article. But as we read it, he seems to maintain in a particularly aggressive vein that most of the "practical men" (i.e., those who have achieved the remarkable measure of practical success of the past few years) have been taking "undue risks" and have had no "justifiable object." Surely when he suggests that all the "practical men" who have lifted aviation into an everyday achievement are "indifferent to theory," and when he makes the astounding statement that there is a "spirit of hostility," which ought to become a "spirit of rivalry" between those men and the mathematician, he writes himself down a prejudiced partisan and he tries to arouse similar hostility in the public—in other words, he plays the part of the extremist, and he exerts a baneful influence on the growing industry.

Even if we take another line suggested by Mr. Hubbard's letter, is it fair for Professor Bryan to tell the public that those responsible for the aeroplanes of the present day have shown a sad neglect of the mathematical and scientific side of aeronautics? Has it not been equally open to Professor Bryan and his professed mathematicians to prove the superior merits of their methods of working? And did the Brothers Wright, M. Blériot, MM. Voisin, Mr. Farnan and others receive any sort of financial public support prior to successful achievement?

Then again, on the subject of stability, raised by Mr. Hubbard—and even though we are the last in the world to decry the importance of automatic stability—can the present aeroplanes be deemed so much more unstable than all other forms of successful locomotion? Is the bicycle stable apart from its rider? Is the motor car stable when actually travelling, but for the constant control of the driver?—Ed.]



### Wheels on Wing Tips.

[1090] Seeing the number of accidents, in one or two cases with fatal results, that have been caused through a wing-tip touching the ground in making a turn, I am rather surprised that constructors do not fit wheels to the ends of the planes as Mr. Cody does on his biplanes. I think I am right in saying that the Dunne aeroplane was recently smashed under such circumstances, when the pilot was forced to make a sharp turn to avoid an obstacle.

Would not such accidents be prevented by doing as I have suggested? It would be interesting to hear the views of some experienced person on this point.

Palmer Green.

E. R. BROWN.

[It is not uncommon practice to fit some form of guard or lightskid for the above purpose, but wheels to be of any real service must be strong and add more weight than is desirable on a light machine.—Ed.]

### Giders.

[1091] Recently you gave directions how to make a "Voisin man carrying glider." Does the glider have a motor as it was not mentioned in FLIGHT?

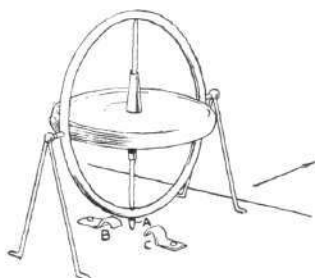
Leyton.

CHARLES ROWE.

[Our correspondent is apparently under a misapprehension as to what a glider is. A glider is an aeroplane without a motor and its essential purpose is to afford a relatively inexpensive flying machine whereon an experimenter may obtain considerable acquaintance with the actual riding of the air, although his flights are necessarily limited in duration and extent inasmuch as they must take place down hill. Gliding is accomplished down the side of a suitable slope.—Ed.]

### Gyroscopic Control.

[1092] As wild and impractical ideas seem to be at present in the air, will you allow me to draw your attention to my own pet scheme. It seems to me that the gyroscope affords the only possible solution to the problem, and the gyroscope



that I would suggest would be quite small, almost a toy, electrically driven, and always revolving horizontally; it would be mounted in the manner of a ship's compass, that is the aeroplane would be able to swing either laterally or longitudinally without in any way affecting it. To make myself clear, let us take the lateral movement alone. Round the inner ring of the gyroscope is placed an

electrical contact, as in the sketch marked A. As long as the aeroplane remains horizontal there is no contact with B and C, but as the plane tilts the contact is made, and the current passes round an electro-magnet, which brings the engine into play, and the aileron on the low side would be jerked down, and remain down until the contact is broken. This could be done in a great number of ways, and experiment alone would show which was going to be reliable. My own rough experiments with the gyroscope seem to point to ultimate success along the lines I have suggested.

Glasgow.

D. GREIG.

### Bird Flight.

[1093] Can any reader of your valuable paper explain to me how it is that a bird with a mutilated tail (in some cases merely a stump) can fly and soar equally as well as one with this particular member in perfectly sound condition. It certainly appears to me that a bird, when in soaring flight, has no use for its tail to preserve stability. Is this so?

Balham, S.W.

S. FAULKNER.

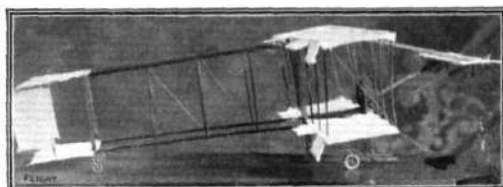
[Opinions differ on the use of the tail in bird-flight. Some birds unquestionably can fly quite well with a mutilated tail; others, however, cannot. If the bird can fly without its tail, then the set of its wings is such as to give it stability, and the use of the tail is probably an adjunct to facilitate direction and for special manoeuvres such as alighting.—Ed.]

## MODELS.

### Model Farman.

[1094] Seeing that you encourage model-makers by publishing their results in your valuable paper, I venture to send herewith a photo of a model Henry Farman biplane I have just finished. It is 1 in. to 1 ft. scale, the drawings appeared in your paper, No. 42, October 16th, 1909.

A model of this description is not expensive to construct considering that the one in the enclosed photo cost under



4s. 6d. for materials. It is jointed together, no nails, screws or bolts being used. This makes it just as strong and does not require so much patience.

I herewith send a list of materials used, where I got them and the price:—

Birch wood, Hobbies, Ltd., 42 ft., 1s. 2d.; floral wire, R. Dyas, 3 reels, 3d.; varnish, R. Dyas, 2d.; wheels, Gamages, 2 pairs, 1s. 10d.; fabric, nainsook, 1 yd., 5d.; gelatine, R. Dyas, 4d.; gum, R. Dyas, 3 tubes, 3d. Total, 4s. 5d.

Hoping this may be of use to fellow readers.

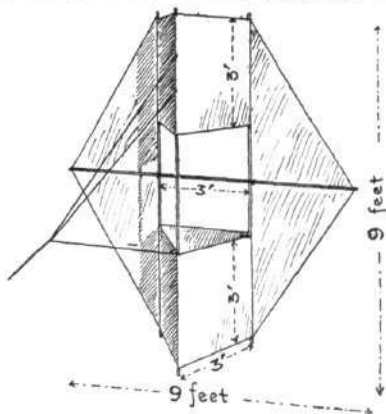
Clapham.

A NOVICE.

### Kites.

[1095] In reply to Mr. J. W. Lane's query in FLIGHT, No. 936, my kite No. 4 is 9 ft. high and 9 ft. broad. It consists of two triangular boxes and wings, and the fabric used is linenette.

The other dimension will be seen in the diagram. Round deal 1 in. diameter is the wood used throughout. Cord run



round the outside of the wings to keep them from fraying out. The entire area is 80 sq. ft. If this information is insufficient I hope Mr. Lane will let me know.

Thames Ditton.

C. B. RIDLEY.

### Longitudinal Dihedral.

[1096] I have been experimenting on and off for the last two years with models of the O-P-1-1 type and I have noticed in particular that, within certain limits, an increase or decrease in the fore and aft dihedral angle of the planes affects very appreciably both the longitudinal stability and the speed of flight, to the extent that an increase in this dihedral angle augments the stability whilst at the same time the speed is reduced, and conversely that a decrease in the angle has just the opposite effects both as regards speed and stability until the value of the angle is 0°, then the stability vanishes. When

I varied the dihedral angle of the model I took care to restore its fore and aft balance (not stability) by adjusting distance between main plane and elevator.

Assuming the above facts to be correct, is there any method of arriving at the value of the fore and aft dihedral angle which will produce maximum speed with maximum stability? I should also like to know how far the A.S.L. have experimented in this direction.

Westcliff-on-Sea.

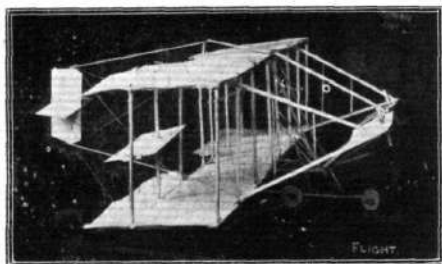
"UNFLEDGED."

[Our correspondent's symbolical reference is apparently to a Blériot type monoplane but the type does not seriously affect the principle involved, which is that the longitudinal dihedral is necessarily a source of increased resistance because both planes cannot be equally efficient. The less the dihedral, therefore, the higher the speed, so the problem resolves itself into a question of what is the least dihedral that will provide the desired amount of stability. Stability is, after all, very much a relative matter and what would suit one may be deemed inadequate by another.]

We are not aware of any definite results of experiments in this direction with the Valkyrie monoplane.—Ed.]

## Model Cody Biplane.

[1097] I have pleasure in enclosing a photo of a model of Mr. S. F. Cody's aeroplane. It is built to scale  $\frac{1}{2}$  in. to 1 ft.,



from drawings published in your journal November 12th, 1910. The framework is made of white pine, and braced with strong thread.

Wandsworth.

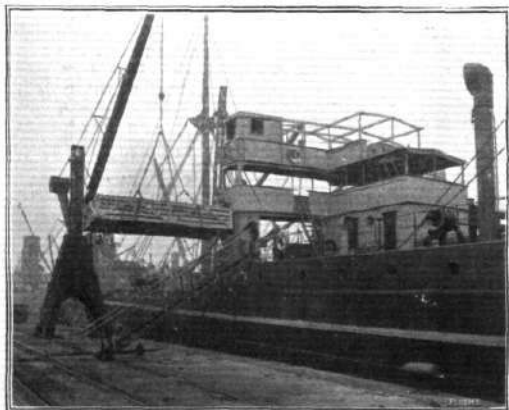
F. FISHER.

## Model Construction.

[1098] Perhaps some reader would kindly answer a few questions for me through your valuable journal—(1) What size propeller should I have to drive a monoplane 3 ft. in length by 30 ins. across main planes, the area being 279 sq. ins. (2) what size elastic should I require? (3) what is the best way to fasten the propeller on to a bicycle spoke?

West Clendon.

F. G. NEWMAN.



Shipping a "Bristol" biplane to Straits Settlements in the Far East per steamship "Glen Line" (McGregor, Gow and Co., Ltd.).—We announced recently that amongst other shipments this machine had been despatched.

## RECORDS.

**Duration.**—Henry Farman (France), at Etampes, on a Henry Farman biplane fitted with a Gnome motor: 8 hrs. 12 mins., covering 463 kiloms. (288 $\frac{1}{2}$  miles)

**Distance.**—Maurice Tabuteau (France), at Buc, on a Maurice Farman biplane, 584.935 kiloms. (365 miles) in 7h. 48m. 31 $\frac{1}{2}$ s.

**Altitude.**—G. Legagneux, at Pau, on a Blériot monoplane, fitted with Gnome motor, 3,200 metres (10,746 ft.).

**Speed.**—A. Leblanc (France), on a Blériot monoplane, fitted with Gnome motor, 5 kiloms. in 2 mins. 45 $\frac{1}{2}$  secs. = 108 k.p.h. (67 $\frac{1}{2}$  m.p.h.).



## PUBLICATIONS RECEIVED.

*Advisory Committee for Aeronautics. Reports and Memoranda, No. 19. Report on the Theory of a Stream Line past a Plane Barrier.* By Sir G. Greenhill. London: Wyman and Sons, Ltd. Price 5s.

### Catalogue.

*Model and Full Size Aeroplanes, Engines, and Accessories.* S. Summerfield, Sherrard Street, Melton Mowbray. Price 3d.



## Aeronautical Patent Published.

Applied for in 1910.

Published March and, 1911.

3,394: J. W. SEDDON. Device for ascertaining velocity of wind.

## "FLIGHT" ART PAPER EDITION.

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## DIARY OF COMING EVENTS.

### British General Events.

- Mar. 24-April 1: Olympia Aero Show.
- July 22 .. *Daily Mail* Round England Contest.
- July 28 .. Gordon-Bennett Aviation Cup Contest.
- Oct. 31 .. Close of British Michelin Cup.
- Mar. 8 .. "Some Lessons of 1910." By Major J. N. C. Kennedy at Caxton House (A.A. and M.U.).
- Mar. 8 .. "Problems Relating to Aircraft." By Mervyn O'Gorman at Institute Automobile Engineers.
- Mar. 8 .. "Vertical Flight and Reduced H.P." By Joseph Clarkson at Merchant Venturers' Technical College, Bristol.
- Mar. 10 .. Lecture by Mr. S. F. Cody (Midland A.C.).

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